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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/027,158 | 12/20/2001 | Mansour Tahernezhadi | 29250/CE08732R | 1203 |

29978 7590 10/06/2003

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EXAMINER

SINGH, RAMNANDAN P

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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2644

DATE MAILED: 10/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/027,158

Applicant(s)

TAHERNEZHAADI, MANSOUR

Examiner

Dr. Ramnandan Singh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 December 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____. 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Claim 6 recites a limitation " a **peak adaptive filter coefficient**" on page 14, line 8. This feature is not shown. Therefore, the above feature must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

Content of Specification

2. (a) **Title of the Invention**: See 37 CFR 1.72(a) and MPEP § 606. The title of the invention should be placed at the top of the first page of the specification unless the title is provided in an application data sheet. The title of the invention should be brief but technically accurate and descriptive, preferably from two to seven words may not contain more than 500 characters.

3. The title of the invention is too long. The suggested title is as follows:

PROTECTING AN ECHO CANCELLER AGAINST RANDOM TRANSITIONS IN
ECHO PATHS

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-5, 8-10, 12-13, 16-18, 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Laberteaux [US 6,028,929].

Regarding Claim 1, Laberteaux teaches a method for controlling an echo canceling system 25 shown in Fig. 2, the method comprising the steps of:

detecting an occurrence of a non-linear echo path when the time dispersion value moves above a time dispersion threshold, otherwise the echo path is assumed to be linear. Thus, an experimentally chosen time dispersion value of this threshold provides a transitional indication from non-linear echo path to linear echo path and vice-versa [Fig. 6; col. 10, lines 1-10; col. 7, line 58 70 col. 8, line 56];

entering a time varying mode when a non-linear echo path is detected, and adaptation of the tap coefficients is inhibited in this mode; and initiating an output decision logic to control the echo canceling system [col. 10, lines 40-57].

Claim 16 is essentially similar to Claim 1 and is rejected for the reasons stated above apropos of Claim 1

Regarding Claim 2, see a plurality of tests at steps 200 and 205 of Fig. 6 [col. 8, lines 32-46; col. 9, lines 21-35].

Claim 17 is essentially similar to Claim 2 and is rejected for the reasons stated above apropos of Claim 2.

Regarding Claim 3, the adaptive filter 35 in Fig. 2 generates a synthesized echo estimate to a desired signal energy; and Fig. 6 illustrates a logic employing tests at step 200 and 205 to detect a non-linear echo path [step 210].

Claim 18 is essentially similar to Claim 3 and is rejected for the reasons stated above apropos of Claim 3.

Claims 4 and 5 are essentially similar to Claim 3, and are rejected for the reasons stated above.

Regarding Claim 8, see Fig. 6.

Regarding Claim 9, when a non-linear echo path is detected, the echo canceller 25 enters a time-varying mode (i.e. transient mode) [col. 9, lines 21-35; col. 10, lines 40-45] and employs a predetermined value of the counts of a counter to reset the system [col. 8, line 32 to col. 9, line 8].

Regarding Claim 10, Laberteaux discloses determining whether the echo path response is linear or no-linear [col. 8, lines 32-35].

Regarding Claim 12, Laberteaux discloses applying the coefficient time dispersion characteristic of the adaptive filter using the output and input of the adaptive filter shown in Fig. 5, for detecting a linear or non-linear echo path [Fig. 5; Abstract].

Regarding Claim 13, Laberteaux teaches employing an error energy for determining the quality of echo cancellation [col. 5, lines 24-37; col. 6, lines 35-50; col. 8, lines 32-46].

Regarding Claim 20, the adaptive filter 35 generates a synthetic echo.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laberteaux as applied to claims 1, 3 above, and further in view of Caceres et al [US 6,167,133] and further, in view of Romesburg [US 6,185,300 B1].

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Regarding Claims 6 and 7, Laberteaux does not teach expressly checking a presence of weak echo and that of a strong echo in a communication system.

Caceres et al teaches detecting strong and weak echo in a communication system [Figs. 10-15; col. 2, line 52 to col. 3, line 12; col. 3, lines 56-67; col. 11, lines 43-50; col. 12, lines 3-27].

Romesburg teaches determining a status of an echo canceller including a level of system convergence based on a ratio of a peak update coefficient value and a baseline update coefficient value, wherein the baseline update coefficient value serves as a normalizing factor [Fig. 4; col. 2, lines 32-39; col. 11, lines 37-54; col. 12, lines 46-59]. Further, the maximum and minimum thresholds are determined [col. 14, lines 26-39; col. 15, line 19 to col. 16, line 9].

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to apply the detection techniques for weak and strong echoes of Caceres et al with Laberteaux so as to detect and track echo during a call more accurately [Caceres et al; col. 1, lines 6-10]; and the echo cancellation status indicator of Romesburg with Laberteaux to provide an effective echo cancellation in a bi-directional communication system [Romesburg; col. 1, lines 12-15].

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8. Claims 11, 14, 15, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laberteaux as applied to claims 1, 3, 10, 16 above, and further in view of Romesburg [US 6,507,653 B1].

Regarding Claim 11, Laberteaux does not teach expressly applying an NPL having a center clipper counter value. However, the NPL is well-known in the art for suppressing residual echoes.

Romesburg teaches applying NPL 146 with a center clipper counter value [Fig. 5; col. 10, lines 29-54].

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to apply the NPL of Romesburg with Laberteaux so as to minimize clipping and distortion of desired voice signals and provide satisfactory echo suppression [Romesburg; col. 1, lines 12-15].

Claims 14 and 15 are also rejected for the reasons stated above.

Regarding Claim 19, Romesburg teaches a comfort noise generator 149 to provide a comfort noise signal to replace the clipped echo with noise samples such that the noise fill matches the noise present in the communication channels [Fig. 5; col. 13, lines 25-35]

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

(i) Grizmala et al teaches measuring an echo using a peak value of a filter coefficient with a peak detector [col. 7, lines 48-61; col. 13, lines 45-68];

(ii) Farrell et al [US 6,516,063 B1] teaches applying a non-linear processor for detecting linear and non-linear echo paths;

(iii) Fujii et al [US 5,237,562] teaches detecting echo path transitions, [see ALL].

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Ramnandan Singh whose telephone number is (703)308-6270. The examiner can normally be reached on M-F(8:00-4:30).


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester Isen can be reached on (703)-305-4386. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)306-0377.

Dr. Ramnandan Singh
Examiner
Art Unit 2644





FORESTER W. ISEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2/00